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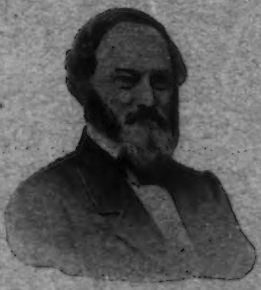

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ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA

VOL. XXXII JANUARY, 1921 No. 1

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Notes on Ecology of Injurious Tenebrionidae (Col.).

By J. S. WADE, Scientific Assistant, Bureau of Entomology, Washington, D. C.

Some genera of native Tenebrionidae at one time considered of negligible economic importance are becoming, in the larval stage, each year more destructive to newly sown wheat and other grains over the semi-arid regions of the middle and western United States. The area of especial infestation comprises central and western Texas, Oklahoma, Kansas, Nebraska, eastern New Mexico, Arizona, California, and the Pacific Northwest.

Of the family Tenebrionidae about 10,000 species of widely varying form and size are known, and about 750 of these occur within the limits of the United States. In the western and southwestern states where the larger number of species occur they, like the Carabidae of eastern localities, comprise the most conspicuous portion of the Coleopterous fauna. Most of the species are black or dark brown, and some of the larger forms have long awkward legs and a peculiar loose-jointed appearance. A number of the species, notably *Eleodes* and *Blapstinus*, pos-

sess very few structural characters in common, and are linked together by such gradual changes and such great variations in structure, within their respective limits of distribution, that their classification presents great difficulties.

The following notes are based upon observations and collections made with special reference to relation to cereal crops, by the writer or other assistants of the Bureau of Entomology in the states of Arizona, California, Colorado, Idaho, Iowa, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, and Washington. Thus far it has been found that species most injurious to growing crops are those within the genera *Eleodes, Embaphion, Blapstinus,* and within the old genus *Asida.* It is probable, however, that in the near future species within other closely related genera will become pests upon the consequent destruction of native grasses and other host plants, and the cultivation of the soil. The injury to wheat and other grain is wrought by the larvae in destroying the newly sown grain before and during its germination in the fall.

Field surveys have been sufficiently extensive to secure data of significance bearing on the distribution factors of the injurious species as related to possible control measures. Any notes on local environment which throw light upon the various conditions under which the insects occur in numbers, and under which they might become serious pests, may afford valuable hints as to the most successful control measures, or may indicate types of ground or other conditions to be avoided in growing susceptible crops.

Climatic limitations. The conditions of a region in relation to various phenomena of the atmosphere, such as temperature and moisture, forms an especially important factor in the dispersal of these insects. It has long been known that these insects, especially the Eleodiini, occur chiefly in arid regions; thus, there are comparatively few species in the northeastern United States, while there are many in the southwestern portions of the country.

Character of soil. Observation has shown that the species under consideration are found most abundantly, under similar

physical and climatic conditions and altitudes, in sandy or sandy loam soils. The fact that such soils are much better suited to the multiplication of these insects than those containing a high percentage of clay, has been repeatedly noted by collectors, and the general prevalence in a locality of a hard "gumbo" or of a clayey surface is not suitable for the best development of these Tenebrionidae. In instances where there are small local sandy areas and clay is the predominating soil, such as often occurs in western Kansas and western Nebraska, the arenaceous areas are usually much more productive for the collector of these beetles. The great abundance of beetles of the genus *Eleodes* has been repeatedly correlated with friable and often gravelly as well as merely sandy soil and sub-soil.

Condition of soil. The breaking of native sod, especially on sandy land, and the consequent changes in the condition of the soil, also has an important bearing on the multiplication of the injurious species. The epigaeal Tenebrionidae are less abundant on such land while it is under cultivation, as by such process the immature stages more often are distributed and exposed to the elements and to enemies. It is noted, however, that the insects are found abundantly in grass and weeds near to and around the edges of such areas. The breaking up of sod on hard land may occasionally favor the increase of Eleodiini and Asidini, probably by furnishing a medium beneath which the adults can more easily deposit eggs and obtain shelter. Further, it has been repeatedly observed that *Eleodes* are much more abundant on strips of plowed land which were afterwards permitted to run wild than on the native hard surface around such plowed portions. The presence of humus also increases the likelihood of greater infestation. The adults of *Eleodes* and *Embaphion* appear to show marked preference for the areas upon which grass is scanty and short instead of those upon which the growth is heavy. They are also more easily found, in warm weather, near sunset or during twilight.

Drainage of soil. All collections made indicate that good drainage favors the multiplication of *Eleodes* and other Tenebrionidae of like habits. Other conditions being equal, gently sloping hillsides usually are more heavily infested than are the

flats between them. When collecting upon a gently rolling surface, it has been repeatedly noted that a difference in altitude of only a few feet may be sufficient to cause a change in the number of specimens found, there being fewer on lower ground where drainage would be imperfect. It also frequently happens that a field located in lower ground surrounded wholly or in part by slightly higher areas may be practically free of damage, although the insects are present nearby in abundance.

It has long been known that a prolonged dry spell in the semi-arid regions caused practically complete disappearance of Tenebrionidae from the surface of the ground. Notwithstanding the fact that the beetles normally avoid low-lying damp spots, yet showers form the most effective stimulus to bring the adults to the surface from their subterranean cells in which the pupal life has been passed. Such showers will be found by the collector to be in direct ratio to the abundance of specimens found. Adults leave shelter and run about just before or just after a rain, and throughout the day during cloudy weather, in the manner habitual to their twilight activities.

Covering of soil. If the growth of vegetation is sufficiently heavy entirely to cover and shade the ground, these insects are present only in small numbers, whereas if the covering of weeds, thistles, and debris is not too thick, the insects may flourish in abundance. All of the different genera under consideration are often found in greatest profusion under small piles of Russian thistles (*Salsola kali* var. *tenuifolia* Mey.) which have been cut and piled in small heaps preliminary to destruction by fire, or where thistles and other trash, blown by high winds, have lodged along fence rows and other obstructions. They are usually present in greatest numbers beneath piles of dried rather than green thistles. Both larvae and adults can be found beneath loose straw around the edges of wheat and in stockyards around shocks, wheat stacks, and piles of threshed straw. Greater numbers occur beneath edges of new straw piles than of those two or three years old. *Eleodes* are often congregated, sometimes in considerable numbers, under dried leaves at the base of the common thistle (*Cirsium lanceolatum* Hill). Such habits might of course be used to

advantage in ridding infested land of the pest, by destroying all weeds and trash, and at the same time harmonize with good farm practice. The beetles are also found quite abundantly in the immediate vicinity of railroad tracks, under rubbish that has been scattered about, par icularly under bits of cardboard, sheet metal, and paper. The latter appears to be such a favorite shelter for adults that paper might serve as a good cover for poisoned baits when such are used as a control measure. Occasionally beetles are noticed on vacant lots along edges of streets and sidewalks in residential sections of towns within infested districts, and there are a few records where under favorable conditions they have developed into garden pests. It does not, therefore, appear that these insects avoid ground already occupied by the ordinary activities of man.

While heavy pasturage appears to keep down these insects, the presence of cattle in moderate numbers, where cattle-raising is practiced on native ranges, is probably conducive to the multiplication of *Eleodes*, such conditions and such effect being largely similar to that preceding the arrival of the pioneer, when buffalo pastured upon these areas. In instances where the herds of cattle are not too large there appears to be slight likelihood of the insects being trampled out, particularly in the loose or sandy soils. Wherever grass is at all scanty, the number of cattle becomes more limited, which condition decreases chances for injury and destruction of the insects. The dried dung forms excellent shelter, under such conditions, for adults, and possibly for the larvae. A marked preference is shown by the adults for such cover, especially if the cakes are thin, and sufficiently well dried to possess non-conducting properties. Serious damage by this pest often follows planting of a cereal crop on old pasture land or on adjacent land, as such a tract might serve as a center of infestation for all nearby cultivated fields.

Areas upon which systematic crop rotation has not been practiced and upon which wheat has been planted year after year without fallowing are generally much more heavily infested.

While an infested field is likely to contain several species, there will be occasional areas containing a large majority of specimens of a single species, which constitutes the principal pest of that immediate locality. Hence collections made on July 31 at Ford, Kansas, around newly stacked wheat in upland sandy loam, furnished practically all adults of *Eleodes opaca* Say, whereas collections made at Dodge City, Kansas, 15 miles away, three days later, under the same general conditions, furnished practically all adults of *Eleodes obsoleta* Say. Again collections made on July 22 at Plains, Kansas, from beneath wheat shocks in an upland field recently in native sod, were nearly all adults of *Eleodes suturalis* Say, whereas collections made at Liberal, Kansas, 20 miles distant, two days later, under the same general conditions, furnished practically all adults of *Eleodes opaca* Say. The complexity of distribution points to the necessity for more careful study of the different species of similar habits from a greater number of collections made over more extended and diverse territory before deductions as to control should be considered absolutely trustworthy.

While the scope of this paper does not include a discussion in detail of prevention and control, it is believed that a study of the factors as outlined, affecting the distribution of these pests in relation to possible control measures, will indicate that a carefully worked out system of crop rotation will prove to be one of the best measures to be advocated. However, the keeping down of weeds, and destruction of all debris, especially dead and decaying vegetable matter upon or near to infested tracts, together with late winter or early spring plowing doubtless also will prove to be of much value.

A New Pterophorus (Lepid.).

By W. S. WRIGHT, San Diego, California.

Pterophorus fieldi, n. sp.

Expanse 21 to 26 mm.

Palpi, front and vertex mottled light brown and white; antennae whitish with very fine brown annulations.

Anterior part of thorax buff, this color spreading out into the base

of costa of primaries, somewhat darker and narrower in females than males. Thorax dorsally brown, becoming lighter basally. Abdomen light brownish buff on anterior part with a red-brown squarish spot close to base, becoming quite dark, almost seal-brown, mottled with lighter on the anal segments.

Fore wings: Ground color white, the costal edge, discal area from base to cleft, and inner margin broadly brown-streaked, the spaces between being more or less suffused with light brown scales. A dark brown costal streak just above the base of the cleft, connected broadly with the outer end of the discal streak, preceded and followed by white; another brown costal streak at the base of the first lobe occupying about one-half the space then narrowly white to apex. Extreme tip dark, two short dark longitudinal streaks, rather faint, near the base of the lobe. A white spot resting on the base of the cleft connected obliquely by a fine white line to the outer costal white spot. Second lobe brown at tip, a faint brown line down the center, a small rectangular white spot on vein 1*b* at about one-third from the base. Fringe smoky, a whitish spot at anal angle, darker within the cleft, a very dark spot a little inward from tip of first lobe.

Hind wings dull smoky brown with a faint reddish tinge and darker fringes.

Legs white, more or less mottled with light brown, a small brush of appressed brown scales at end of fore tibia. The middle tibia shows the same development and in addition has a small cluster of long scales at the center. Hind tibia as the middle, but a little more prominent. Spurs light at base, smoky at tip.

In many specimens the scale clusters on tibiae become more or less obsolete, being represented by a slight swelling of the member at middle and end.

Types: Male, San Diego, California, May 24, 1910 (Geo. H. Field). Female, San Diego, California, June 23, 1911 (Author). In author's collection.

Paratypes: 33 specimens, male and female, in Mr. Field's and the author's collections. All taken at San Diego, California, between the 24th of May and the 26th of June.

Seventy-two specimens were examined in this study; all were taken at light.

The species is dedicated to my friend, Mr. Geo. H. Field, whose tireless field work has added many new species and much valuable information to the literature of West Coast Entomology.

Notes on Microlepidoptera with Descriptions of New Species.

By ANNETTE F. BRAUN, Cincinnati, Ohio.

Isophrictis similiella Chambers.

Gelechia similiella Chambers, Can. Ent. IV, 193, 1872.

Paltodora similiella (Chambers) Busck, Proc. U. S. N. M., XXV, 779, 1903; XXX, 722, 1906.

The only reference to the life history of this species is found in Mr. Busck's *Revision of American Gelechiid Moths,* where he mentions the rearing of poor specimens from flower heads of sunflower from Oklahoma.

The larvae bore in the receptacle of the flower heads of black-eyed Susan (*Rudbeckia hirta*). At pupation the larva burrows down into the stem for a distance of one-fourth to two or three inches, where it makes an opening to the outside, and then pupates in the stem.

The species is very common locally around Cincinnati, nearly every flower head containing one or more of the whitish larvae. The moths emerge during the flowering period of the plant, which extends from June to August.

Aristotelia robusta n. sp.

Head and face yellowish fuscous, palpi dark fuscous irrorated with black; second segment whitish inwardly and at extreme apex outwardly, third segment shorter and thicker than usual, apical half white; extreme tip sometimes black. Antennae blackish fuscous in the apical half, with the last segment, and fifth and tenth from the tip white; beginning with the fourteenth segment from the tip, paler fuscous, annulate with yellowish white.

Fore wings dull ocherous rather densely overlaid with purplish fuscous dusting, especially toward apex, where it obscures the ground color. Before the middle of the wing and beginning within the costa, a darker shade crosses the wing very obliquely to the fold where it spreads out, rarely reaching the dorsal margin near tornus. At two-thirds a not very oblique yellowish costal streak passes to the middle of the wing just beyond the rather elongate black spot at the end of the cell. A dark line at the base of the cilia is broken on the costa by four faint ocherous spots; similar pale spots sometimes visible along termen. Hind wings fuscous. Legs dull yellowish, densely dusted with dark fuscous outwardly. Alar expanse: 11-12 mm.

Type (♂) and 30 paratypes reared from larvae mining

leaves of *Scirpus atrovirens,* Cincinnati, Ohio. Type and paratypes in writer's collection, paratype in collection of the Academy of Natural Sciences of Philadelphia.

The larvae begin to mine early in April. The mine extends toward the tip of the leaf, beginning as a small transparent blotch, with an opening on the under side of the leaf; following this is a linear green portion with sides nearly parallel, in which the leaf substance is not eaten; beyond this the mine expands and becomes larger and semi-transparent. When ready to pupate, the larva leaves the mine through a circular hole in the upper side of the linear green portion. Larva whitish with head black, thoracic plate dark brown, a brown spot on posterior half of 9 and anterior half of 10. The imagoes emerge in early June.

This species is most easily distinguished by the thickened dark palpi with sharply contrasting whitish apical half of the third segment.

Telphusa agrifolia n. sp.

Palpi with second segment dark gray, irrorated, with inner side and sometimes extreme tip whitish, third segment black, sometimes with an indistinct whitish annulus near tip. Face gray, head blackish, irrorated; antennae black, with gray annulations.

Fore wings with large patches of raised scales; ground color brownish black, sometimes with golden brown reflections, especially in the apical half, and sometimes unevenly dusted with pale brownish and whitish scales.

In one form an oblique whitish band crosses from basal fourth of costa to near middle of dorsum, and follows the dorsum, but is interrupted just before the tornus by an extension of ground color to the margin; at the tornus it curves upwards and ends beneath the apex; its shape and position are almost exactly those of the white band in *T. longifasciella* Clemens. An inwardly oblique irregular line of paler scales sometimes crosses the wing from apical third of costa to just beyond the middle of the dorsum. The ground color is darkest immediately before the oblique band, and before the curved portion of the whitish area beneath the apex.

In the more common form, the white is almost everywhere replaced by dull blackish blue; a longitudinal streak of whitish scales sometimes remains just below basal fourth of costa; a few pale scales follow the inner edge of the curved portion beneath the apex.

Three darker spots along costa in apical third, a dark patch at apex,

and three or four small dark spots along termen. The patches of raised scales are situated as follows: one within the dorsal margin near base; beyond it another at the inner edge of the white band; raised scales border the white band also just above the fold; beyond the fascia on the disk a large tuft, and beyond this tuft, but nearer the costa, a minute tuft; obliquely below the first of these, a larger tuft in the fold, followed by a large tuft above the fold, immediately above the second of these tufts, and sometimes connected with it, is a small tuft. Just above the space between the two large tufts the ground color is darkened. A line of slightly raised scales borders the inner edge of the curved portion of the band beneath apex. Hind wings brownish gray, darker along the margins, cilia concolorous. Legs fuscous, irrorated, with tips of segments whitish. Alar expanse 13.5-14 mm.

Type (♂), a specimen of the dark form, reared from larva on California live oak, *Quercus agrifolia;* Alameda County, California. Paratypes: Alameda County; Redwood Canyon, Marin County; Dutch Flat, Placer County; Mt. Saw Tooth, Tulare County, California, 11,500 ft. Type in the writer's collection, paratypes in the collection of the Academy of Natural Sciences of Philadelphia, the California Academy of Sciences, and in the U. S. National Museum.

The following note will aid in identifying the larva: Head and next two segments dark plum-colored, remainder of body grayish with tubercles dark.

This species is the closest ally of the eastern *T. longifasciella* Clemens, but is very distinct from it. The dark form is the most common; specimens with a distinct whitish band are rather unusual, but all gradations between the two occur together.

Recurvaria ceanothiella n. sp.

Face white, head dusted with dark fuscous; palpi black, second segment with a narrow white annulus near apex, and another at extreme apex, more whitish inwardly, third segment with a white annulus at base and middle, extreme tip white. Antennae dark fuscous, basal segment white anteriorly, stalk annulate with gray.

Fore wings whitish, densely dusted with dark fuscous; three darker shades cross the wing obliquely, at one-fourth, one-half and three-fourths respectively, sometimes scarcely distinguishable from the rest of the wing except as dark patches on costa. Between the first of these and the base of the wing, a small black spot on costa; between

the first and second dark shade, a black spot within the costa; beyond the third dark shade, a narrow whitish streak, sometimes almost obliterated by dusting, curves inward just within the costa, then runs obliquely outward to the termen just beyond tornus. A more or less distinct black dot in apex, preceded by one or two more or less distinct black dots on costa and termen. Three large patches of black raised scales in a line about equally spaced, the first two in the fold, the third above it, and lying in the dark shades. Nearer the base than the first of these is a small black spot on the dorsal margin. Hind wing without hair pencil in male. Legs gray with tips of segments silvery; a faint paler bar across hind tibiae. Alar expanse: 11-13 mm.

Type (♂) and a large series of paratypes reared from larvae mining leaves of *Ceanothus divaricatus* Nutt., Dutch Flat, Placer County, California. Type and paratypes in the writer's collection, paratypes in the collections of the Academy of Natural Sciences of Philadelphia and the California Academy of Sciences.

The mine starts on the lower side of the leaf, usually next to the midrib; the entrance guarded by a short tube of silk. The mine is at first linear, with branches extending out from it; later blotchlike, including the linear portion. Pupa in a cocoon between two leaves tightly spun together. Larvae received February 20, imagoes April 15 to May 6.

The curved pale streak at three-fourths and the line of three patches of raised scales are the most distinguishing characteristics of this species.

Brachmia hystricella n. sp.

Face pale straw-colored, head brownish ocherous, palpi brownish ocherous, upper and lower edge with a fine white line from base to apex, antennae brownish, banded beneath with whitish.

Thorax and fore wings brownish ocherous or fuscous; veins distinctly outlined with pale straw color; costal and dorsal margins and a streak from middle to end of cell also whitish; a curved white streak, with convex side toward the costa, lies between the cell and costal margin. There is a round black discal spot on the middle of the cell, and a similar one at the end of the cell; an elongate black spot in the fold beginning below the first discal; all three spots edged with white scales. Costal cilia straw-colored, cilia on termen fuscous, sharply contrasting along a diagonal line at apex; margin of termen blackish, cilia with two parallel fuscous lines, of which the outer is usually the darker and broader. Hind wings whitish straw-colored or grayish. Legs straw-colored. Alar expanse: 13-15 mm.

Type and seven paratypes reared from larvae in rolled leaves of *Hystrix patula,* Cincinnati, Ohio. Type and paratypes in writer's collection, paratype in collection of the Academy of Natural Sciences of Philadelphia.

There are several generations a year; larvae winter in the rolled leaves and reach maturity early in spring.

Larva with head brownish ocherous, lateral margins dark reddish brown, the dark brown continuing on the whitish first thoracic segment as two posteriorly converging lines, next four segments dark reddish brown, anterior margins of second and third thoracic segments whitish, remaining abdominal segments whitish, with subdorsal brown line and oblique brown bar extending from subdorsal line at anterior margin of each segment posteriorly and ventrally.

Brachmia badia n. sp.

Head and face ocherous, palpi with a white line beneath; antennae ocherous, ends of segments brownish ocherous above.

Thorax and fore wings ocherous, the scales in the outer half of the wing tipped with a slightly deeper more reddish color. A dark brown discal dot in middle of cell, and a larger slightly transverse spot at end of cell, a dark brown plical spot a little anterior to the first discal. Cilia concolorous with wing; with two faintly indicated darker lines along the termen. Hind wings whitish. Legs brownish ocherous. Alar expanse: 16 mm.

Type (♂), Fredalba, California, August 13 (G. R. Pilate). Type in writer's collection.

The addition of this species to our fauna is interesting because it shows the extended distribution of the genus in the United States.

Ethmia longimaculella Chambers.

Ethmia longimaculella Chambers, Can. Ent., IV, 43, 1872; Dyar, Jour. N. Y. Ent. Soc., X, 207, 1902; Barnes & Busck, Contrib. Nat. Hist. Lep., IV, pl. XVII, f. 14, pl. XXXVI, f. 1, 1920.

syn. *walsinghamella* Beut., Ent. Am., V, 9, 1889.

Large numbers of the larvae of this species were found feeding on leaves of *Lithospermum latifolium,* Clermont County, Ohio, July 10. The larva when young spins a web on the under side of a leaf, stretching from midrib to a lateral vein, but not reaching the margin. At this time it eats the lower side of the leaf, leaving the upper epidermis untouched. Later it folds the leaf upwards, bringing the margins together near

the base; within this it spins a fine web spreading outwardly; the lower epidermis is left uneaten now.

The larva is a very conspicuously marked creature: head almost black, first thoracic segment golden brown, second thoracic segment very dark reddish brown, remaining segments somewhat paler brown with four irregular pale brownish yellow conspicuous transverse bands situated as follows: at the anterior margin of the third thoracic, across the posterior margin of the third thoracic and anterior margin of the first abdominal, at the posterior margin of the fifth abdominal, and at the posterior margin of the sixth abdominal segments respectively.

Cocoon of silk and bits of rubbish on the surface of the ground. Imagoes May 12-15 of the following year.

Heliozela aesella Chambers.

Heliozela aesella Chambers, Can. Ent., IX, 108, 1877.

The larvae produce flattened galls on leaves of grape. The gall consists of an irregularly shaped thickening of the leaf, situated on a vein and extending to either side of it, the area involved rarely being more than one centimeter in diameter, with a thickness perhaps three or four times that of the leaf itself. The galls are paler in color than the rest of the leaf and about equally distinct on the upper and lower surface. The larva consumes most of the leaf substance in the gall, especially in a large oval area, where only the epidermis is left. At maturity it cuts from this area, an oval case, in outline similar to that of *Antispila*. This case, however, does not remain flat, but is rolled up into a spindle, which falls to the ground. The spindle is flattened at each end, where a semi-circular fissure is left, guarded by the closely appressed, flattened, projecting ends. The spindle is then covered with fine particles of earth, and lined throughout with close whitish silk. Within this cocoon an inner pupal chamber is partitioned off; this tapers to a point at the posterior end, but at the anterior end is closed by a flat transverse sheet of papery silk. In emergence, the pupa pushes up this sheet of silk and protrudes from the cocoon to the side of the median line between the flat projecting ends.

The moths appear in the latter part of April and in early May; the galls develop on the expanding leaves and are fully formed by the beginning of June. The larvae reach maturity

about the middle of June. There is but one generation a year.

In the vicinity of Cincinnati I have found the galls only on *Vitis cordifolia*. In other localities it occurs on other species of grape; specimens of the work on a cultivated variety from Boston were submitted to me for identification some years ago by Mr. J. L. King, at that time on the staff of the Ohio Agricultural Experiment Station. In a letter accompanying the specimens he wrote that it has also been observed in the grape belt in northern Ohio.

Argyresthia undulatella Chambers.

Argyresthia undulatella Chambers, Can. Ent., VI, 10, 1874; Busck, Proc. Ent. Soc. Wash., XXXII, 22, 1907.

The larvae mine in the inner living bark of the main trunk and branches of the red elm (*Ulmus fulva*), hollowing out an elongate cavity. In early spring the presence of the larvae is shown by the brownish frass which is pushed to the outside. Early in April, in a crevice of the bark, it spins its cocoon, consisting of an inner spindle-shaped cocoon of very fine soft silk, covered on the outer side with a coarse web of irregular mesh. The cocoons are often found on the trunks in great numbers.

Coleophora coenosipennella Clemens.

Coleophora coenosipennella Clemens; Proc. Acad. Nat. Sci. Phila., 5, 1860; Tin. No. Am., 88, 1872.

The type of this species is not now in existence; but specimens of a species feeding on seeds of *Stellaria pubera* (great chickweed) agree so closely with Clemens' description of that species that I have no hesitation in determining them as that species. There is, however, considerable variation in ground color; the color ranges from very pale yellow to brownish. In the palest specimens, the white streaks are broader than the intervening streaks of ground color; in the darker specimens the reverse is the case, and the ground color almost obliterates the short oblique white streaks between the terminal portions of the costal and distal streaks. The basal segment of the antennae and also two or three succeeding segments are swollen with closely appressed scales. The wing expanse is 11.5—12 mm.

Specimens determined as this species have been placed in

the collection of the Academy of Natural Sciences of Philadelphia, and in the U. S. National Museum.

The moths appear in the latter half of April. Very young larvae were collected feeding within the unopened seed-pods of the chickweed in the middle of May. Even at this time, the flowering stems are wilted down and lying on the ground. The first silken cases were observed on May 25; this silken case is attached to the outside of the pod and the larva feeds on the seeds within. When the valves of the pod begin to curl open, a smooth sheet of silk is spun across, which prevents the seeds from dropping out. To this sheet of silk the case is now usually attached. The larvae feed for about ten days after spinning the silken case. Case short cylindrical, 6 mm. long, with strongly deflexed mouth, three-valved at apex; yellowish white at first, grayish when mature, and decorated with numerous dark reddish granules.

Coleophora borea n. sp.

Face and mid-dorsal line of head brownish ocherous, sides of the head whitish, palpi white above, brownish ocherous or fuscous beneath, second segment with a pointed tuft projecting more than half the length of the third segment; antennae white, annulate with brownish ocherous or fuscous, basal segment and four or five succeeding segments somewhat thickened with scales.

Fore wings brownish ocherous or fuscous with the veins except the base of the upper margin of the cell distinctly outlined in white; dorsal margin white; interspaces between the costal veins shading to dark brown at the base of the costal cilia; the dark brown usually forms a streak below vein 7, extending into the apical cilia; a broad streak sometimes dark brown, sometimes scarcely deeper than the ground color, extends the length of the cell and ends in a dark brown spot, which is most conspicuous in the paler specimens. Cilia brownish ocherous intermixed with white scales, which form a line at the base of the cilia along the termen. Hind wings and cilia fuscous. Legs whitish ocherous, first two pair fuscous outwardly, posterior pair with a fuscous line along the outside. Alar expanse: 15-16 mm.

Type (♂) and 25 paratypes reared from larvae mining into seeds of the climbing false buckwheat (*Polygonum scandens*); Cincinnati, Ohio.

Type and paratypes in the writer's collection; paratypes in the collection of the Academy of Natural Sciences of Philadelphia and in the U. S. National Museum.

The moths appear in the first half of September. The larvae at first feed within the seeds and at the end of November or the beginning of December spin the first case, which is yellowish white, straight and cylindrical, more or less thickly strewn with granules, especially near the mouth, with the apex at this time roughly two-valved. The larvae spin and feed actively when the temperature is well below the freezing point; in fact development takes place more rapidly out-of-doors than in a warm room. The case is gradually enlarged and thickened, becoming dark brownish gray except along a slight projecting keel on the ventral side. The larvae feed during the winter becoming full grown early in March, the case is now almost black, stout cylindrical, 8-9 mm. long, three-valved at apex, with the plane of the mouth forming a very acute angle with the long axis.

The distinguishing characters of this species are the distinct undusted white lines and the dark streak and spot at the end of the cell. From *C. amaranthella*, which also possesses a similar dark spot, it is separated by the absence of dusting. The very different case separates it from the other Polygonum-feeding species, *C. shaleriella*, which is similarly marked with white streaks, but lacks the dark streak and spot.

Coleophora duplicis n. sp.

Face white mixed with pale ocherous; palpi white above, pale ocherous inwardly, fuscous outwardly; antennae white, with first segment somewhat thickened with anteriorly projecting pale brownish scales; stalk either white or with distinct ocherous or fuscous annulations (the variation independent of sex).

Fore wings grayish ocherous, sometimes brownish; very rarely pale brownish ocherous; broad white streaks follow the course of the veins in the costal half of the wing, with the spaces between them dusted with blackish scales and darkening toward margin, the white streak along upper margin of cell also somewhat dusted in its outer half and usually confluent with a short streak through the outer half of the cell; all these white streaks in the costal half of the wing are often confluent with almost entire absence of dusting except toward apex. A broad white dusted streak follows the fold, with the ground color on either side of it not dusted; dorsal margin white. Cilia pale brownish ocherous with scales at their bases white. Hind wings and cilia pale fuscous. Legs white, fore and middle pair outwardly fuscous, posterior pair with a fuscous line on the outer side. Alar expanse: 11.5-14.5 mm.

Type (♀) and eleven paratypes reared from larvae mining seeds of *Aster shortii,* eleven reared from *Aster cordifolius,* twenty from *Solidago caesia* and *Solidago latifolia,* many specimens captured on flowers of Aster in September, all at Cincinnati, Ohio; a series taken on goldenrod flowers, Balsam, North Carolina, August 15-25. Type and paratypes in writer's collection, paratypes in the collection of the Academy of Natural Sciences of Philadelphia and in the U. S. National Museum.

The larvae mine at first within the seeds, later (in October and early November) constructing buff silken cases, marked with darker longitudinal streaks and encircled with backwardly projecting pappus attached near the mouth; occasionally entire dry disk flowers are attached to the case in the same manner; numerous small fragments of flowers are attached near apex. Case short cylindrical, bulging somewhat behind mouth, which forms an acute angle with the axis; apex prominently three-valved, the angles sharp and at base projecting somewhat beyond the general outline of the case.

The following observations on the method of attaching the pappus and constructing the case after the larva leaves the seed may be of interest. The pappus is cut off at equal distances from the seed and passed forward between the legs. The pieces are fastened together around the body of the caterpillar (*i. e.,* attached by the larva working inside) by a few strands of silk. At first they project irregularly, some even pointing forward. When sufficient pieces have been put in position the case itself is spun within the loosely fastened-together pappus and the deflexed mouth is added. At first the case merely converges toward the apex; later the apex is made distinctly three-valved.

The largest specimens are those reared on *Aster shortii,* the smallest on *Solidago caesia;* apparently the difference in size is due directly to difference in food supply resultant upon the small size of the seeds of the latter plant.

In general, this species may be distinguished by the pale costal half of the wing in contrast with the darker dorsal half. Pale brownish ocherous almost undusted specimens, which sometimes occur, are almost indistinguishable from *C. gran-*

ifera. This need not result in confusion of the two species, as *C. granifera* emerges almost three months earlier. The case of *C. duplicis* is almost identical with that of *C. ericoides* on another species of Aster, but besides differences in color and markings *C. ericoides* is much more slender and narrow-winged.

Coleophora biforis n. sp.

Head pale grayish ocherous; palpi whitish, apical half of second segment blackish outwardly; lower edge of third black. Antennae with basal segment thickened with scales, stalk white, with conspicuous dark brown annulations.

Fore wings pale grayish ocherous, marked with whitish lines as follows: A distinct white streak from base along costa for about one-half the wing length; a distinct rather broad white streak from base along upper margin of cell, forking at one-third, the upper fork a continuation of the broad white streak and running out to the middle of costa, the lower fork continuing through the middle of the cell as a very indistinct whitish line, which at the end of the cell bends up to reach costa near apex. Sometimes at the bend it sends a branch to termen. Between the ends of the forks, two short usually detached whitish lines run to costa (sometimes these are branches of an indistinct line along upper margin of cell); narrow whitish lines along fold and along dorsum. Usually the white streak along costa and the white streak along upper margin of cell to middle of costa are the only distinct white streaks. Extreme base of costa blackish. Hind wings pale gray, cilia toward apex ocherous-tinged. Legs pale grayish ocherous. Alar expanse: 11.5-12.5 mm.

Type (♂) and five paratypes reared from larvae mining into seed pods of *Luzula campestris*, Cincinnati, Ohio. Type and paratypes in the writer's collection.

The cases may be found attached to the seed pods in April and May; the moths emerge the following spring at the time of blooming of the food plant. The completed case measures 8-8.5 mm. in length, slender cylindrical, tapering to the three-valved apex. The sides of the obtuse apical angles of the valves are very short; from the point of union of adjacent valves, a gradually lowering ridge runs about half-way down the case.

Two Days with Indiana Odonata.

By E. B. WILLIAMSON, Bluffton, Indiana.

The positive limnotropism shown June 13, 1920, was first evidenced June 6, when Professor Osburn, Dr. Kennedy and myself were attracted to the woodland swamp southeast of Bluffton, Indiana, which I have designated in previous papers as the Vanemon swamp. This swamp will be known, long after its decease, as the locality where the beautiful *Aeshna mutata* was rediscovered. And in that day when the swamp will have become a cornfield will *Aeshna mutata* also have disappeared from the earth? A certain melancholy attends my every visit to this swamp. Twenty years have seen profound changes there, changes that speak too clearly of extinction. One can consider his individual dissolution with a certain equanimity, knowing that nothing of particular value to the race is involved therein. But here, before his eyes, is taking place the extinction of a habitat of numerous species, which will themselves inevitably suffer annihilation at the same time. Are these woodland swamps to pass without a historian to recount the doings of their myriad plant and animal inhabitants? The failure to record the comings and goings and the infinite activities at these swamps will be held by future generations as criminal folly on the part of the generation now living. Sea shores can wait. The woodland swamps are going and going fast, and their wonderful and interesting fauna and flora are going with them.

Our trip to the Vanemon swamp on June 6 was made especially to obtain life history material of *Epiaeschna heros*, in which Dr. Kennedy was interested. He was able in several instances to observe females of this species ovipositing and to obtain the eggs. While he was so engaged, I waded out to the little dwindling patch of spatterdock in the northwest part of the swamp where I found both *Enallagma cyathigerum* and *calverti* flying. It is interesting to note that these two species are absolutely indistinguishable on the wing, just as at the same season, at more open pools and at lakes, *Enallagma ebrium* and *hageni* cannot be specifically recognized in flight. Later in the season certain *Sympetra* present a similar but not quite

so difficult or impossible task for the collector. In collecting in the tropics this difficulty is more rarely encountered. Seven species of *Argia* all taken one day on one small stream were all easily specifically recognizable before being netted.

The appearance of Enallagmas at the Vanemon swamp this year is their second appearance there since 1900. The first appearance was in 1907, when on June 16 and 18, I took 77 males and 25 females of *calverti* and 3 males and 1 female of *cyathigerum*. (ENT. NEWS, July '08.) In 1907 a single male *aspersum* was seen, and I think satisfactorily identified, but not captured. This year a single male of *ebrium* was taken at the swamp, associated with the other two Enallagmas, *cyathigerum* and *calverti*.

Mr. Frank C. Waugh and I went to the swamp on June 13 to complete some observations and make comparisons with conditions noticed a week earlier. The following remarks on the Enallagmas are based on observations made during both trips, June 6 and June 13. On June 6, 13 males of *calverti* and only a single male of *cyathigerum* and a female of each were taken. On June 13 the proportion was different, 32 males of *calverti* and 10 males of *cyathigerum*, and a single male of *ebrium* being taken. The last is a new record for the swamp. The Enallagmas were more numerous on June 13 and were flying generally over the entire swamp. They were restless, seldom alighted, flew close to the water and were therefore not easily netted. They were possibly more abundant about the spatterdock leaves. There are at the present time possibly half a dozen clumps, too small to be called areas, of this plant in the swamp. On June 6 pairing and ovipositing were going on more actively than on June 13, which was a cooler and cloudier day. The pairs rested on the floating spatterdock leaves and so far as observed oviposition was invariably in the upper surface of the leaf, no particular area of this surface being preferred. The female, in couple with the male, held her abdomen nearly vertical and gave a quick push to insert a single egg. A single egg to several eggs might be placed in a leaf, the pair generally moving restlessly from leaf to leaf. The spot of insertion of the egg is soon marked by a

small light brown spot, which, under low magnification, shows many small perforations. The long curved egg is placed vertically in the plant tissue. The larva on hatching must find its way over the leaf surface to the water.

The apical black ring and the sub-apical dorsal black spot on the second abdominal segment of the male were separate in 20 males of *calverti* and 8 males of *cyathigerum*, very narrowly joined by a dorsal line in 13 males of *calverti* and 2 males of *cyathigerum*, more broadly joined in 9 males of *calverti* and 1 male of *cyathigerum*, and very broadly joined in 3 males of *calverti*.

When we visited the swamp on June 6, *Lestes forcipatus* was very numerous as tenerals in the low adjacent woodland and as adults, singly and with many pairs in couple, over the marsh. On June 13 *Lestes uncatus* was the more abundant species, many pairs being seen. On both dates numbers of *Ischnura verticalis* were seen, *Anax junius* was ranging freely over the entire swamp, and on June 6 an occasional male of *Epiaeschna heros* passed high overhead from the forest and back again into the forest, while a few females prowled the ill-defined shore line, occasionally alighting to oviposit. On June 13 a single freshly emerged but mature male *Aeshna mutata* was flying in the vicinity of a spatterdock clump, where it was captured. *Plathemis lydia* and *Libellula pulchella* were common on both dates and on June 13 I saw several males of the restless and wary *Libellula vibrans* at the northeast part of the swamp, near the outlet, and succeeded in netting two of them. On the same date *Pachydiplax longipennis* and *Erythemis simplicicollis* were generally common, the males of the latter species frequently displaying their unique performance by two individuals of flying about each other in intersecting circles. Two males of *Tramea carolina* were seen June 6 and several males and a few pairs of *lacerata* were seen on June 13.

In 1907, when the Enallagmas were discovered at the Vanemon swamp, I visited the old gravel pits and other pools known to me in the county, in an effort to locate other colonies of the species observed at the swamp and no such colonies were lo-

cated. The most likely place to look for such colonies are the Doster ponds, near Poneto, five or six miles southwest of the Vanemon swamp, in the direction of the prevailing winds. The Doster ponds are three artificial ponds lying near together in an east and west row, with a shallow canal, circling to the south through woodland, joining the east and west ponds. A fourth smaller pond lies just south of the west pond. These ponds are of interest as furnishing the single male of *Libellula exusta* ever seen in the county and at the same time when it was taken, and never before or since, *Leucorhinia frigida* was taken at the west pond associated with the *Libellula*.

Leaving the Vanemon swamp, Mr. Waugh and I reached the Doster ponds about eleven o'clock, where we were unable to find either *Enallagma calverti* or *cyathigerum*. At the west pond, the shallowest one, we took *Enallagma hageni* and *ebrium*, and at the east pond *traviatum, exsulans* and *antennatum*, neither of the two taken at the west pond being observed here. No Emallagmas were seen at the middle pond, but *Tramea lacerata* and *Gomphus graslinellus* were seen at all three ponds. At the east pond a single male *Epicordulia princeps* was patrolling the south side.

We returned home about 1.30 o'clock and after a hurried lunch I went to the ripple in the Wabash River, where last year on June 8, *Gomphus crassus* and *fraternus* were flying in numbers (ENT. NEWS, Dec., 1919). The afternoon was cloudy and windy, but in about an hour I caught 22 males of *crassus* and a single male of *graslinellus*. In 1919 about one-fifth of the *Gomphi* captured at the ripple were *fraternus*, but not one was seen this year, while *graslinellus*, not seen in 1919, was represented by a single male in 1920. At the ripple where the *Gomphi* were taken the other dragonflies on the wing were *Hetaerina americana, Argia moesta, Enallagma antennatum* and *Ischnura verticalis*.

To refer again to the Vanemon swamp, a complete list of the dragonflies observed there during the past twenty years may be of interest. No calopterygine, gomphine or corduline has ever been seen at the swamp. The list follows:

Lestes congener, eurinus, forcipatus, rectangularis, uncatus, unguiculatus, Enallagma aspersum, calverti, cyathigerum, ebrium, Nehalennia irene, Ischnura posita, prognatha, verticalis, Anomalagrion hastatum.

Anax junius. Aeshna constricta mutata, Epiaeschna heros.

Libellula pulchella, quadrimaculata, semifasciata, vibrans, Plathemis lydia, Erythemis simplicicollis, Sympetrum ambiguum, obtrusum, rubicundulum, vicinum, Pachydiplax longipennis, Leuchorhinia intacta, Tramea carolina and *lacerata.*

A total of 33 species, which may be taken as practically complete for woodland swamp dragonfly associations in northern Indiana. But this association is no fixed certain thing; it is a fluctuating association marked by comings and goings, by appearances and disappearances, by ebbs and flows. *Libellula quadrimaculata* was there only one year; Enallagmas appeared in 1907, to disappear until 13 years later; certain species are present every year. There are many other species of animals at the swamp of which I know nothing. Formerly a *Sparganium* swamp, the *Sparganium* has entirely disappeared; a *Scirpus* came in, spread for a few years, and has gone; and so it goes. Will not someone appreciate the beauty and interest of this swamp before the swamp itself is gone forever?

A New Xylophanes from Cuba (Lepid., Sphingidae).

By Dr. C. T. Ramsden, Guantánamo, Cuba.

Among Sphingids taken at light at Guantánamo, Cuba, in 1917, appeared what seems to be a new *Xylophanes*, which I take pleasure in naming for Mr. B. Preston Clark, of Boston, Massachusetts, in recognition of his keen interest in this family.

Xylophanes clarki, n. sp.

Head and thorax Prouts brown, a pale ochraceous salmon-colored stripe from in front of, and passing over, eye to end of thorax. Palpi Buckthorn brown. Antennae Prouts brown. Body above Dresden brown, below antimony yellow, while the sides are yellow ochre.

Upperside. Primaries: Dresden brown with seven Prouts brown postmedian tranverse lines which begin near the middle of inner margin and extend apically: the first of these is darkest in color, extends apically for 15 mm., then turns sharply to the costa where it terminates;

the third, fourth and fifth are bowed between the veins, giving a waved effect, forming sharp apices on the veins; the sixth is broader and terminates at the apex; the seventh joins the sixth just before it reaches the apex. On the costal margin at one quarter of the distance from base to apex, a line 2 mm. in length extends obliquely towards the inner margin, then runs basally at right angles for 3 mm.; distally of this line and 1 mm. from it there runs another parallel to it; from these lines basally and limited by the first of the postmedian transverse lines and the inner margin is a pale ochraceous salmon-colored area.

Secondaries: Bister color at base, shading into Prouts brown towards distal margin. A row of eight yellow ochre spots, placed one between each two veins, extends from anal angle nearly reaching the costa.

Underside. Primaries: Basal half of wing Dresden brown. A warm buff patch reaching from inner margin to costa which is of the same color; outside of this is a clay-colored patch which starts at anal angle, widening at center, then narrowing again as it reaches the apex. There is a reddish brown point on each vein in the warm buff patch.

Secondaries: Warm buff. A clay-colored stripe extends from near anal angle along inner margin, widening as it reaches the apex. A row of brown points extends from costa to near anal angle, one on each vein; interior and parallel to these points are two reddish brown lines, the one nearer the base of wing being more pronounced.

Extent of one wing, 29 mm.

Type: One male, Guantánamo, Cuba, 20th June, 1917, in the collection of The Academy of Natural Sciences of Philadelphia.

The above species is close to *X. fosteri* R. & J., but differs from it, above, in having the stigma very obscure while in *fosteri* it is very prominent. The solid brown area between the two basal transverse lines of *fosteri* extending from the inner margin about 4 mm., and standing out in sharp contrast with the rest of the forewing, is entirely lacking in *clarki*. The row of eight yellow ochre spots of the secondaries of *clarki* is replaced by a continuous band in *fosteri*.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., JANUARY, 1921.

Another New Year's Resolution.

A year ago, on the editorial page of the NEWS for January, 1920, we published eleven New Year's Resolutions for the Entomologist. We shall not repeat them here, although they are quite as well worthy of remembrance and of practice in 1921 as in 1920, and we respectfully refer them to the attention of collectors and writers. All of us, including the editor, forget, or neglect to do, things we ought to do. As the result of our neglect the other fellow often must devote some precious time to making good our omissions, deficiencies and errors. Many a half hour, with its opportunity for original or constructive work, is lost because some correspondent needlessly inflicts upon a busy man data which are illegible, uncertain, or incomplete. There is a paper, or a drawing for an illustration, which is unfinished in some detail and must be returned to the author for correction. There are questions raised which the inquirer could have answered for himself by a little more personal effort and investigation. As we grow older, we appreciate more fully the fleetingness of time, the shortening of our working life. Let us add to the New Years's resolutions of 1920 a twelfth for 1921, whose spirit is so general as to include the reason for all those eleven:

Don't bother the other fellow with the sort of things you don't like to be bothered about yourself.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

An Additional Distributional Record for Rhacognathus americanus Stål. (Hemip.-Heterop.)

Concerning the then known distribution of this rather uncommon pentatomid, Uhler remarked (Bull. U. S. Geol. Surv. Terr., II, No. 5, 1876, 282): "Inhabits Illinois, Nebraska and Canada." The species was described four years previously by Stål whose type came from Illinois. Since that time a record for Ohio has been published. Van Duzee (Trans. Am. Ent. Soc., XXX, 1904, 68) mentions a specimen in his collection that was taken at Winnipeg, Manitoba. Hart (Nat. Hist. Surv. Illinois, XIII, 1919, 202) mentions five examples secured in northern Illinois. To the best of my knowledge these constitute the only available definite records for the species and I take pleasure in adding another to the list.

On August 17, 1911, I collected a male on one of the grassy hills in the vicinity of Fergus Falls, Minnesota. This specimen is almost entirely black; the only distinct light markings occur on the tibiae, sternal plates, anterior median longitudinal line of the pronotum and on the connexivum, where the marks are of a reddish tinge. The rugae between the black punctures are but very faintly yellowish. Length of this specimen which is now in my collection, 10.00 mm.

DAYTON STONER, University of Iowa, Iowa City, Iowa.

Further Notes on "A Rare Pamphlet" (Hym., Lep., Neur.)

In ENTOMOLOGICAL NEWS, xxxi, p. 176, June, 1920, Mr. Nathan Banks calls attention to a long-forgotten paper by Dr. A. S. Packard. This paper was to have appeared in volume two of the Transactions of the Chicago Academy in 1870, and was supposed to have been destroyed with the rest of the publication in the great fire until the copy at Cambridge was discovered. The fact that two species of moths were described therein as new, among numerous other insects, aroused our interest in the question raised by Mr. Banks as to its possibly valid publication, and it was with some relief that we read a note by Mr. Grote which accidentally came to our notice a short time later. This note was published in the Canadian Entomologist, xxiv, pp. 182-3, 1892, under the heading "Gastropacha alucensis." The specific name is apparently a typographical error for *alascensis*. At the beginning of this brief paper appears the following statement: "With regard to the omission of this species from 'Mr. Grote's lists,' I would state that I was informed that the entire edition of the Chicago Academy Transactions, in which the description appeared, was destroyed in the Great Fire, and that Dr. Packard in consequence regarded his paper as unpublished." This is, of course, not conclusive evidence, but it is so

nearly contemporary that it seems well to accept the solution offered and regard the paper as unpublished. It would seem that if Dr. Packard held this opinion he and the other authors must have described their material elsewhere or made other disposition of it. The current nomenclature in the genera concerned might throw some light on the matter, but the Lepidoptera described in the paper are so few that we can gather nothing from them. In the genera of the two species described as new we have but one Alaskan specimen each, and these can readily be placed under species named in 1841 and 1871 respectively.

We expect to adopt this opinion in preparing our catalogue of Lepidoptera, but recognize the possibility suggested by Mr. Banks that the later discovery of additional copies may make it necessary to regard the paper as published.

WM. BARNES, M.D., and A. W. LINDSEY, PH.D.,
Decatur, Illinois.

Chalybion Dahlbom not a Synonym of Sceliphron Klug. (Hym.)

In a recent paper Hutson (Trans. Amer. Ent. Soc., vol. 45, 1919, p. 218) tabulates the blue mud-daubers of North America and places them in the genus *Sceliphron* Klug, giving *Chalybion* Dahlbom as a synonym. For the black and yellow mud-daubers he would use the name *Pelopaeus* Latreille. This change in the generic names for these groups is most unfortunate because it is not only unnecessary but contrary to the Rules of the International Commission on Zoological Nomenclature. Hutson defends his usage by reference to recommendations *k* and *u* of the International Commission, but entirely overlooks the designation of genotypes made by previous students. In 1810 Latreille designated as type of *Pelopaeus* the species *spirifex* and in 1897 Bingham chose the same species as type of *Sceliphron*. The species *spirifex* was included in the original account of both of the genera and the type designations must be considered as valid, even though Bingham did not follow certain *recommendations* (he violated no *rules*) of the International Code. *Sceliphron* Klug and *Pelopaeus* Latreille are isogenotypic and since *Sceliphron* has priority Latreille's name must fall as a synonym. The black and yellow mud-daubers are therefore *Sceliphron* and the blue mud-daubers *Chalybion*. The synonymy is, briefly, as follows:

Sceliphron Klug (1801)—Type. *Sphex spirifex* Linnaeus (Bingham 1897).

Pelopaeus Latreille (1802)—Type. *Sphex spirifex* Linnaeus (Latreille 1810).

Pelopaeus Patton, Hutson and others.

Chalybion Dahlbom (1843)—Type. *Sphex cyaneum* Linnaeus (Patton 1880).

Sceliphron Hutson.

S. A. ROHWER, U. S. National Museum, Washington, D. C.

Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are all grouped at the end of each Order of which they treat.

For records of Economic Literature, see the Experiment Station Record. Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

1—Proceedings of the Academy of Natural Sciences of Philadelphia. **2**—Transactions of the American Entomological Society, Philadelphia. **4**—Canadian Entomologist, London, Canada. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **13**—Journal of Entomology and Zoology, Claremont, Cal. **17**—Lepidoptera, Boston, Mass. **39**—The Florida Entomologist, Gainesville. **42**—Entomoligiske Meddelelser udgivne of Entomologisk Forening, Kjobenhavn. **49**—Entomologische Mitteilungen Berlin-Dahlem. **50**—Proceedings of the United States National Museum, Washington. **62**—Bulletin of the American Museum of Natural History, New York. **68**—Science, Lancaster, Pa. **76**—Nature, London. **90**—The American Naturalist, Lancaster, Pa. **104**—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. **108**—Journal of Genetics, Cambridge, England. **111**—Archiv fur Naturgeschichte, Berlin. **116**—Entomologische Zeitschrift, Frankfurt a. M.

GENERAL. Allard, H. A.—The flight of fireflies and the flashing impulse. **68,** lii, 539-40. **Casey, T. L.**—Remarks on family names. **68,** lii, 491-2. **Hertwig, P.**—Abweichende form der parthenogenese bei einer mutation von Rhabditis pellio. (Arch. Mikrosk. Anat., xciv, 303-37.) **Hopping, R.**—Some winter insect life. **4,** lii, 217-18. **Hudson, G. V.**—On some examples of New Zealand insects illustrating the Darwinian principle of sexual selection. (Trans. Proc. New Zealand Inst., lii, 431-8.) **Krausse u. Wolff**—Eine uebersicht uber die bisher aufgestellten fossilen und rezenten insektenenordnungen. **111,** 1919, A, 3, 150-71. **Nielsen, J. C.**—Obituary by J. P. Kryger. **42,** xiii, 1-11. **Schuster, W.**—Entomologische anzeichen einer wiederkehrenden tertiarzeitahnlichen tierlebensperiode? **116,** xxxiv, 62-3 cont.

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ORTHOPTERA. Brindley, H. H.—Further notes on the food plants of the common earwig. (Forficula auricularia.) (Proc., Cambridge Phil. Soc., xx, 50-55.) **Rehn, J. A. G.**—Records and descriptions of Brazilian O. **1,** 1920, 214-93.

HEMIPTERA. Allard, H. A.—Some observations concerning the periodical cicada. **90,** liv, 545-51. **Distant, W. L.**—Description of a new genus and species of Cicadidae from Cuba. **11,** vi, 455-6. **Haviland, M. D.**—Preliminary note on antennal variation in an aphis (Myzus ribis.) (Proc., Cambridge Phil. Soc., xx, 35-41.)

LEPIDOPTERA. Bodley, H. S. J.—Butterfly delicacies. **17,** iv, 84. **Frazier, W. E.**—Collecting butterflies at night. **17,** iv, 83-4. **Frohawk, F. W.**—Duration of stages of Pyrameis atlanta. **9,** liii. 252-4. **McMurray, N.**—Some collecting notes. **17,** iv, 82-3. **Onslow, H.**—Inheritance of wing color in L. Melanism in Boarmia abietaria. **108,** x, 135-40. **Thompson, E. C.**—Climatic variations in E. imperialis. **17,** iv, 83.

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DIPTERA. Keilin et Picado.—Biologie et morphologie larvaires d'Anastrcpha striata, mouche des fruits de l'Amerique centrale. (Bul. Scient., France et Belgique, xlviii, 423-41.)

Alexander, C. P.—New Nearctic crane-flies. Pt. X. **4,** lii, 224-9.

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450.) **Wolff, M.**—Bermerkungen uber die p Porizoninen-gattungen Isurgus und Tersilochus. **111,** 1919, A, 3, 139-50.

Cushman, R. A.—North American ichneumon-flies, new and described, with taxonomic and nomenclatorial notes. **50,** lviii, 251-92.
MacGillivray, A. D.—New saw-flies from Maine and New York. **4,** lii, 233-6.

A New Study of the Economic Value of Dragonflies.

Under the heading "Dragonflies and Damselflies in relation to pond fish culture, with a list of those found near Fairport, Iowa," Professor C. B. Wilson has published in the Bulletin of the U. S. Bureau of Fisheries (Vol. 36, pp. 185-264) an interesting and valuable contribution to knowledge of the biology of this group of insects. His paper deals with the fundamentals of animal economy—food, enemies and conditions for reproduction. His material was obtained in and about the ponds of the Fisheries Biological Station at Fairport, a description of which is first given. Then the relative abundance of the dragonflies found there in the summer, as definitely determined by counts of cast nymphal skins left at emergence, is given. These counts show the skimmer, *Libellula luctuosa* to be by far the most numerous, with *Erythemis simplicicollis* second. Then the food of 250 nymphs determined by examination of the contents of the alimentary canal, is given. These records corroborate and extend the observations of Miss Mary B. Lyon at Ithaca (*Entomological News* 26: 1-15, 1919) and of Alfred Warren in Hawaii (*Coll. of Hawaii Bull.* No. 3, 1915), and show that while there are differences in diet according to species and size of individuals, the staple foods in these ponds are small snails of the genera *Physa* and *Planorbis*, mayfly nymphs and crustaceans. All the forms studied eat also dragonfly nymphs smaller than themselves, and some are cannibals, eating the young of their own species. Two later sections of the paper discuss Odonata as food for fishes, summarize the results of past studies on wild fishes and add some new data.

There are numerous figures that are, on the whole, well executed: but the cleft middle lobe, shown in the labium of *E. simplicicollis* in figure 13, is surely an artifact or an error. The occipital tubercules shown so prominently in the new hatched nymph of *Epicordulia princeps*, usually present, though small, on newly hatched nymphs of Libelluline dragonflies, are not shown on any of the half dozen figures representing new hatched nymphs of that subfamily.*

Under "experiments in hatching eggs," half a dozen species of

*If the grave error charged against Needham & Lloyd of publishing (on page 389 of their *Life of Inland Waters*) a photograph without stating whether the photograph was taken under natural or under artificial conditions, may be helped thereby, the reviewer will here state that the two were photographed as found in nature, and the nymph was not starved into eating the fish.

dragonflies and two of damselflies are treated, and figures and descriptions are given of the egg, the newly hatched nymph and of its detached labium; data on incubation and behavior accompany some of the descriptions. The paper concludes with an annotated list of the 64 species known to occur near the Biological Laboratory.

The bibliography is less extensive in scope than the paper itself. There is a brief account of the masticatory structures of the nymphal gizzard, but with no mention of the extensive work of Ris and others upon these structures. There is an extended account of mouth parts, both nymphal and adult, but without mention of Miss Butler's comprehensive work upon these and their development.

Since the argument in favor of dragonflies as of value in pond culture is based mainly on food relations, it is regrettable that one serious error mars both the statement of facts and the argument. This is the oft repeated and almost traditional error of including water boatmen among the enemies of fishes. Hungerford's studies published in Volume 25 of the *Journal of the New York Entomological Society* (1917), showed clearly that corixids are not predatory at all, but feed on algae and disintegrating plant residue.

This report is more a report of investigation and less an essay than was the Lamborn volume of 1890; but one may admit all the facts it presents without being able to concede that animals like Odonata, almost wholly carnivorous, and in part cannibals, are likely to prove a better source of animal food for fishes than are such herbivores as scuds, mayflies and midges, whose great function in life is that of turning grass into flesh. The question as to what forms may best be increased artificially for providing fishes with suitable animal food, will doubtless be settled eventually by actual production of some of them, and not by argument. If this work of Professor Wilson's paves the way for some sustained intensive rearing operations on particular species under controlled conditions at the Fairport Laboratory or elsewhere, we may eventually have some knowledge of their real economic value.—J. G. NEEDHAM.

Doings of Societies.

The American Entomological Society.

Meeting of June 9th, 1919, in the hall of The Academy of Natural Sciences, fourteen persons present, Pres. Dr. Henry Skinner presiding.

Dr. Calvert moved the Society endorse the movement for the exclusive use of the metric system. Seconded and carried.

Lepidoptera.—Mr. Coxey exhibited a specimen of *Papilio weiskei* C. Ribbe, from the Aroa River, New Guinea, collected at an elevation of 8000 feet. This was described in *Insecten Börse*, xviii, 1900. The allied species from the A. N. S. Collection were also shown.

Diptera.—Mr. George M. Greene exhibited a specimen of *Spheco-myia vittata* Wied. which he collected along the Wissahickon Creek at Chestnut Hill, Pennsylvania, v. 19, 1919; stated he had also taken it at Falls Church, Virginia, iv. 17, 1917, and that there are four New Jersey records (Ins. New Jersey, III, p. 771, 1910).

Orthoptera.—Mr. Rehn remarked on the distribution of the genus *Anconia*, mentioning a new species from Texas.

Odonata.—Dr. Calvert referred to Dr. C. T. Ramsden's account of the life of Juan Gundlach in ENTOMOLOGICAL NEWS for 1915, including a list of his papers, among which is one on Cuban Neuroptera. The speaker summarized the results of his own study of this paper, as published in the *Transactions* of the Society, volume xlv, and exhibited specimens of the true *Enallagma pollutum* Hagen and its northern representative, *E. vesperum*, in connection therewith.

GEO. M. GREENE, *Recording Secretary.*

Meeting of October 23rd, 1919, in the same hall, eleven members present, Dr. Skinner presiding.

Lepidoptera.—Dr. Skinner exhibited a box of the recent additions to the collection, also a box containing the specimens figured in the colored plate in Dr. Calvert's "A Year of Costa Rican Natural History," which have been deposited in the collection.

Mr. Laurent stated that from cocoons of *Philosamia cynthia* gathered on September 5th, three moths emerged on September 29th and 30th, due no doubt to the warm weather prevailing the last half of the month. The speaker said that under ordinary conditions these moths would not have emerged until next year, as the species is single brooded in this vicinity.

Orthoptera.—A series of the handsome grasshopper *Schistocerca melanocera* (Stål) was shown by Mr. Hebard. The species is known only from the Galapagos Islands. Differences in coloration were pointed out and genetic factors and local environmental influences were said to be the causes of these. That other species divide into very interesting insular races on different islands of the Galapagos Archipelago was remarked.

Hymenoptera.—Mr. Rehn made a few remarks on the similarity of the white-haired Mutillids of the Southwestern United States to the seed pods of the creosote bush (*Covillea tridentata*).

Diptera.—Mr. Hornig made some comments on local mosquitoes, also showing his series of habitat pictures, larvae, pupae, drawings of same and adults of a number of the species.

J. A. G. REHN, *Secretary pro tem.*

ENTOMOLOGICAL NEWS for December, 1920, was mailed at the Post Office at Lancaster, Pa., on December 23, 1920.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted—For cash, or exchange, papers on insect biology, ecology or behavior (especially aculeate Hymenoptera). P. Rau, 2819 S. Kings highway, St. Louis, Mo.

Brachynus wanted for cash or exchange from any part of North America. J. W. Green, 520 McCartney St., Easton, Pa.

Lepidoptera Hesperidae wanted.—I will purchase or exchange and also name specimens. South American species particularly desired. Henry Skinner, Logan Square, Philadelphia, Pa.

For Exchange—Iowa Catocalae in A-1 condition. Wanted, Cocoons of Actias luna also other lepidoptera. Mrs. O. F. Hiser. Arnolds Park, Iowa.

Books Wanted—Entomological News, Vol. 11, Nos. 1, 3, 5; Vol. 14, Nos. 1, 7. Brooklyn Museum Library, Eastern Parkway and Washington Ave., Brooklyn, N. Y.

Wanted—N. A. Coleopterists interested in European Coleoptera. Liberal exchanges and friendly correspondence. Mr. C. Crozet, 155, Via Cavour, Rome, 23, Italy.

Japanese and Formosan Butterflies will be exchanged by S. Satake, 48, Aoyama-minami-machi, 5-chome Tokyo, Japan.

Wanted—To purchase or exchange papers and books on insect Biology, Ecology and Behavior, especially aquatic Hemiptera.—C. F. Curtis Riley, Department of Forest Zoology, The New York State College of Forestry at Syracuse University, Syracuse, N. Y.

Wanted—North American or European Coleoptera to determine in exchange for specimens.—R. T. Garnett, 625a 14th st., Oakland, Cal.

Wanted—Species of Rhynchophora from Eastern North America not represented in my collection, in exchange for duplicates from Indiana and Florida. Lists of desiderata and duplicates on application.—W. S. Blatchley, 1530 Park Ave., Indianapolis, Indiana.

Omophron and **Elaphrus** desired, in numbers, including the common species. Good exchange given. H. F. Wickham, Iowa City, Ia.

Wanted—To examine, determine and exchange Cicadellidae or "Jassidae" from all parts of North America. J. G. Sanders and D. M. DeLong, State Capitol, Harrisburg, Pa.

Wanted—To purchase Stretch, Illustrations of the Zygaenidae and Bombycidae of North America.—Dr. E. T. Learned, Fall River, Mass.

Lepidoptera.—Offer in exchange for rare S. American Lepid., about 400 Rhopalocera in papers from S. Cameroun (Africa), mostly Papil. Pierid, Danaid, Satyrid and Nymphal.—J. H. Jurriaanse, Shiekade 75, Rotterdam, Holland.

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802.—**Malloch** (J. R.).—Descriptions of new North American Anthomyiidae. (Trans., **46**, 133-196, 3 pls., 1920).... 1.10

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A-4.—**Hebard** (M.).—Studies in Malayan, Papuan, and Australian Mantidae. (Proc. A. N. S. P., **1920**, 14-82, 2 pls.) 1.10

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